CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. An interconnection wiring system containing at least one capacitor comprising:

a substrate having a planar upper surface of insulating areas and conductive regions therein,

a first level of interconnection wiring interconnecting said conductive regions,

said first level of interconnection wiring further including a patterned region to form the lower electrode of a capacitor,

a first dielectric layer formed over said lower electrode,

a top electrode formed over said first dielectric layer to form the top electrode of said capacitor, said top electrode having a perimeter interior to the perimeter of said first dielectric layer,

a second dielectric layer formed over said first level of interconnection wiring over said first dielectric layer and over said top electrode, said second dielectric layer being substantially thicker than said first level of interconnection wiring, said first dielectric layer and said top electrode,

said second dielectric layer having an upper surface and having vias filled with conductive material to said upper surface and in contact with regions of said first level of interconnection wiring

and said top electrode, and

a second level of interconnection wiring interconnecting said vias filled with conductive material.

2. The interconnection wiring system of claim 1 wherein said lower electrode has an upper surface of titanium nitride.

3. The interconnection wiring system of claim 1 wherein said top electrode has a lower surface of titanium nitride.

4. The interconnection wiring system of claim 2 wherein said top electrode has a lower surface of titanium nitride.

5. An interconnection wiring system containing at least one capacitor comprising:

a substrate having a planar upper surface of insulating and conductive regions therein,

a first level of interconnection wiring interconnecting said conductive regions,

a first dielectric layer formed over said first level of interconnection wiring,

said first dielectric layer having an upper surface and having vias therein filled with conductive material to said upper surface and in contact with regions of said first level of interconnection wiring,

at least one of said vias having dimensions to form said lower electrode of a capacitor,

a second dielectric layer formed over said lower electrode and extending beyond the perimeter of said lower electrode, and

a second level of interconnection wiring interconnecting the vias filled with conductive material and formed over the second dielectric layer to form said top electrode of said capacitor.

6. The interconnection wiring system of claim 1 wherein said lower electrode has an upper surface of titanium nitride.

7. The interconnection wiring system of claim 1 wherein said top electrode has a lower surface of titanium nitride.

8. The interconnection wiring system of claim 6 wherein said top electrode has a lower surface of titanium nitride.

9. A method for forming an interconnection wiring system containing at least one capacitor comprising the steps of:

selecting a substrate having a planar upper surface of insulating areas and conductive regions therein,

forming a first level of interconnection wiring interconnecting said conductive regions, and

forming a patterned region to form the lower electrode of a capacitor,

forming a first dielectric layer over said lower electrode,

forming a top electrode over said first dielectric layer to form the top electrode of said capacitor wherein said top electrode has a perimeter interior to the perimeter of said first dielectric

layer.

forming a second dielectric layer over said first level of interconnection wiring, over said first dielectric layer and over said top electrode, wherein said second dielectric layer being substantially thicker than said first level of interconnection wiring, said first dielectric layer and said top electrode,

forming vias in the upper surface of said second dielectric layer down to regions of said first level of interconnection wiring and to said top electrode and filling vias with conductive material to said upper surface, and

forming a second level of interconnection wiring interconnecting said vias filled with conductive material.

10. The method of claim 9 further including the step of forming a lower electrode having an upper surface of titanium nitride.

11. The method of claim 9 further including the step of forming a top electrode having a lower surface of titanium nitride.

12. The method of claim 10 further including the step of forming a top electrode having a lower surface of titanium nitride.

13. A method of forming an interconnection wiring system containing at least one capacitor comprising the steps of:

selecting a substrate having a planar upper surface of insulating and conductive regions therein,

forming a first level of interconnection wiring interconnecting said conductive regions,

forming a first dielectric layer over said first level of interconnection wiring, wherein

forming vias in the upper surface of said first dielectric layer down to regions of said first level of interconnection wiring and filling vias therein with conductive material to said upper surface, and

at least one of said vias having dimensions to form said lower electrode of a capacitor,

forming a second dielectric layer over said lower electrode and extending beyond the perimeter of said lower electrode, and

forming a second level of interconnection wiring interconnecting the vias filed with conductive material and formed over the second dielectric layer to form said top electrode of said capacitor.

14. The method of claim 13 further including the step of forming a lower electrode having an upper surface of titanium nitride.

15. The method of claim 13 further including the step of forming a top electrode having a lower surface of titanium nitride.

16. The method of claim 14 further including the step of forming a top electrode having a lower surface of titanium nitride.